February 2011 Summary for Southwest Lower Michigan

Brandon Hoving
National Weather Service Grand Rapids, MI

Overview

February 2011 will be remembered for two major winter storms that will rank as some of the most significant to have ever impacted the region. The most powerful storm of the winter season produced blizzard conditions across the region February 1st and 2nd. Record daily snowfall occurred on February 2nd in Lansing while Grand Rapids set records on the 1st and 2nd. The storm total snowfall of 16.0" in Grand Rapids ranks this blizzard as one of the top ten snow storms on record in terms of storm total snowfall. Commerce was greatly inhibited on February 2nd, with some business and government offices shutting down for the first time since the Great Blizzard of 1978.

In addition, a significant ice storm hit Southwest Lower Michigan on the 20th. Ice accumulations from one quarter to three quarters of an inch fell across the southwest corner of the state. The storm wiped out power to thousands of households. Further north, 6 to 12 inches of snow led to hazardous roads. A 60-car pileup occurred on U.S. 131 near Big Rapids.

February 2011 was near to slightly below normal in terms of temperature and featured record or near record snowfall with above average precipitation (Table 1). Record snowfall occurred in Lansing with monthly snowfall reaching second place in Grand Rapids.

February 2011 Summary for Southwest Lower Michigan

TABLE 1. Average temperature, precipitation and snowfall totals for February 2011 at the primary climate stations. Normals are computed from the 1971-2000 30-year average.

Location		Average Temperature (degrees F)	Precipitation (inches)	Snowfall (inches)
Grand Rapids	*Reported*	**25.6**	**2.96**	**38.2**
	Normal	**25.0**	**1.54**	**12.2**
	Departure	**+0.6**	**+1.42**	**+26.0**
	Record Max Avg (year)	**34.4 (1984)**		
	Record Min Avg (year)	**3.2 (1978)**		
	Record Max (year)	**69 (1999)**	**5.77 (1898)**	**41.6 (2008)**
	Record Min (year)	**-24 (1899)**	**0.21 (1907)**	**0.5 (1998)**
Lansing	*Reported*	**24.4**	**2.36**	**29.1 (R)**
	Normal	**24.0**	**1.45**	**10.6**
	Departure	**+0.4**	**+0.91**	**+18.5**
	Record Max Avg (year)	**33.9 (1882)**		
	Record Min Avg (year)	**4.7 (1875)**		
	Record Max (year)	**69 (1999)**	**7.46 (1938)**	**29.1 (2011)**
	Record Min (year)	**-37 (1868)**	**0.22 (1969)**	**0.0 (1877)**
Muskegon	*Reported*	**26.3**	**2.67**	**36.4**
	Normal	**25.4**	**1.58**	**18.3**
	Departure	**+0.9**	**+1.09**	**+18.1**
	Record Max Avg (year)	**35.0 (1998)**		
	Record Min Avg (year)	**12.5 (1904)**		
	Record Max (year)	**67 (1999)**	**5.30(1908)**	**45.8 (1981)**
	Record Min (year)	**-30 (1899)**	**0.16 (2003)**	**0.5 (1932,1961)**

February 2011 Summary for Southwest Lower Michigan

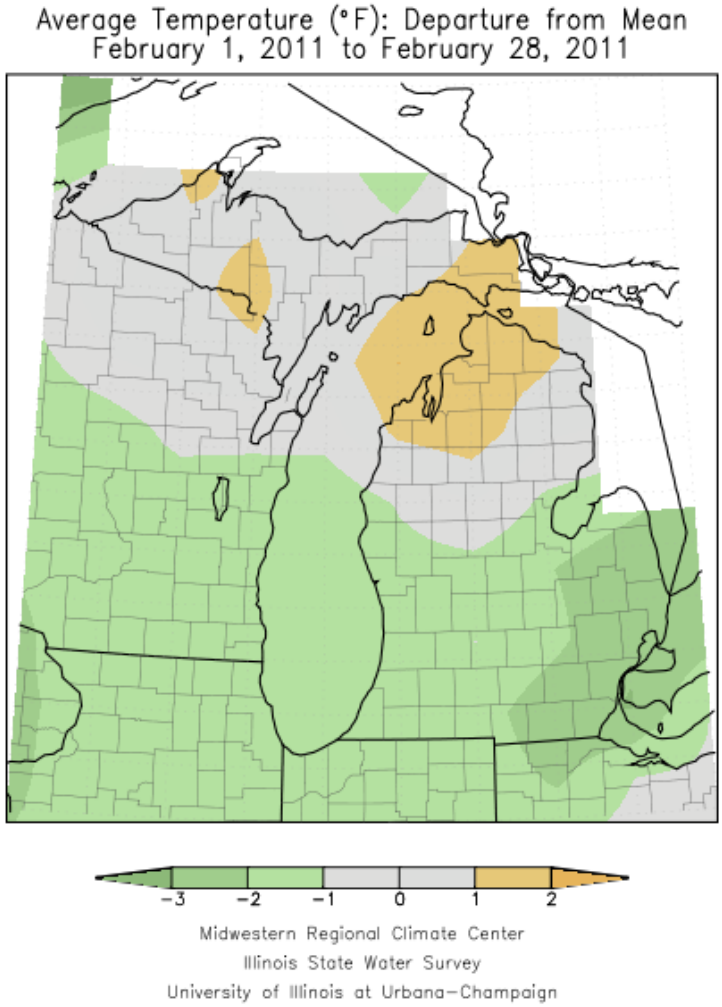

FIG. 1. February 2011 average temperature departure from normal.

Temperatures:

Temperatures for February 2011 ranged from slightly above normal values across northern Lower Michigan to slightly below normal across southern Lower Michigan (Fig. 1). Nineteen local climate stations showed an overall average of 0.9 degrees below normal. There was some degree of variability across the area, however, with the three official climate sites averaging slightly above normal temperatures.

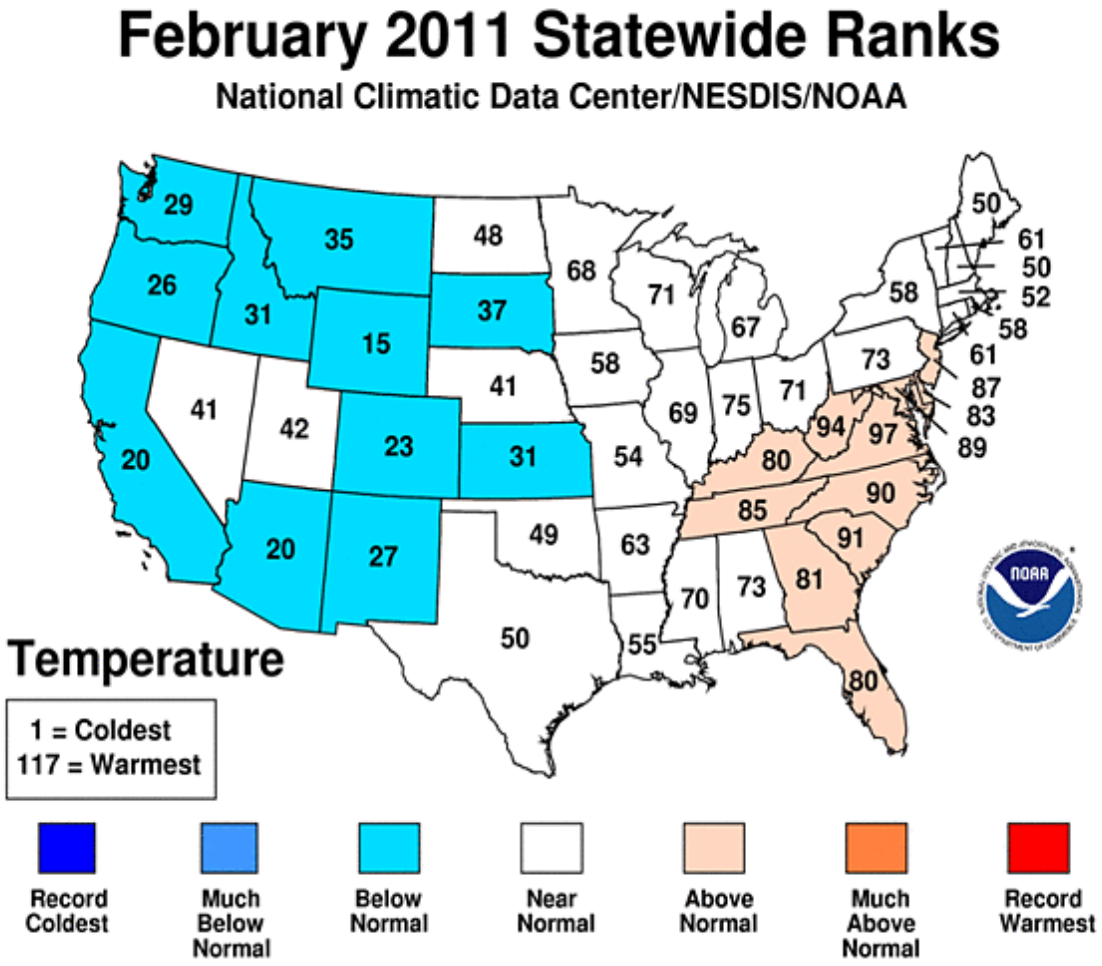

FIG. 2. National Climate Data Center state temperature ranking for February 2011.

February 2011 was the 67th coldest February for the state of Michigan, placing it approximately in the middle ranking of the period of record (Fig. 2). As a whole, the country was about evenly split with above normal temperatures in the East with below normal temperatures in the West.

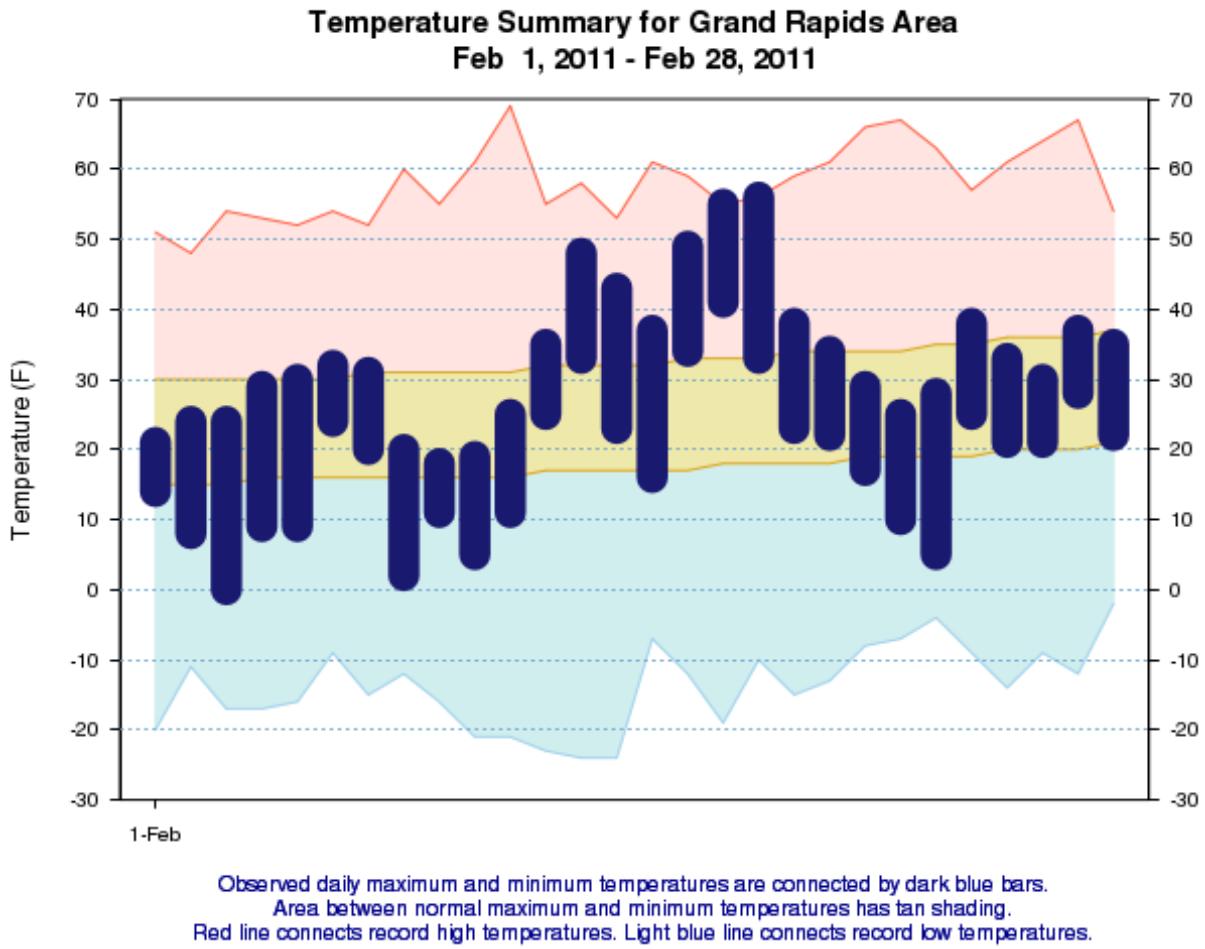

FIG. 3. Observed temperatures at the Grand Rapids International Airport. Dark blue bars are the temperature range for each day. The yellow strip indicates the normal range of temperatures. Record high and low temperatures are indicated at the top of the pink area and the bottom of the blue area, respectively.

At Grand Rapids, record warmth occurred on February 17 and 18 (Fig. 3) with a tied record high of 55 degrees on the 17th and a new record high of 56 degrees on the 18th. No below zero readings were recorded for the month. Table 2 reveals all three sites recorded above normal readings for highs at or above 50 degrees.

TABLE 2. February 2011 temperature frequencies at the primary climate stations.

Number of days	Grand Rapids	Lansing	Muskegon
highs ≥ 50 (2011)	2	3	1
highs ≥ 50 (2010)	0	0	0
highs ≥ 50 (normal)	1.2	1.4	0.7
highs ≥ 50 (record)	8	10	7
year(s) of record	1976	1880	2000
highs ≤ 32 (2011)	15	17	15
highs ≤ 32 (2010)	17	20	18
highs ≤ 32 (normal)	14.9	14.6	14.5
highs ≤ 32 (record)	28	28	28
year(s) of record	1901	1978	1901
lows ≤ 32 (2011)	24	26	24
lows ≤ 32 (2010)	26	28	28
lows ≤ 32 (normal)	26.4	26.9	26.4
lows ≤ 32 (record)	29	29	29
year(s) of record	Many	Many	Many
lows ≤ 0 (2011)	0	0	0
lows ≤ 0 (2010)	0	0	0
lows ≤ 0 (normal)	2.3	4.2	1.6
lows ≤ 0 (record)	13	21	13
year(s) of record	1978	1875	1904

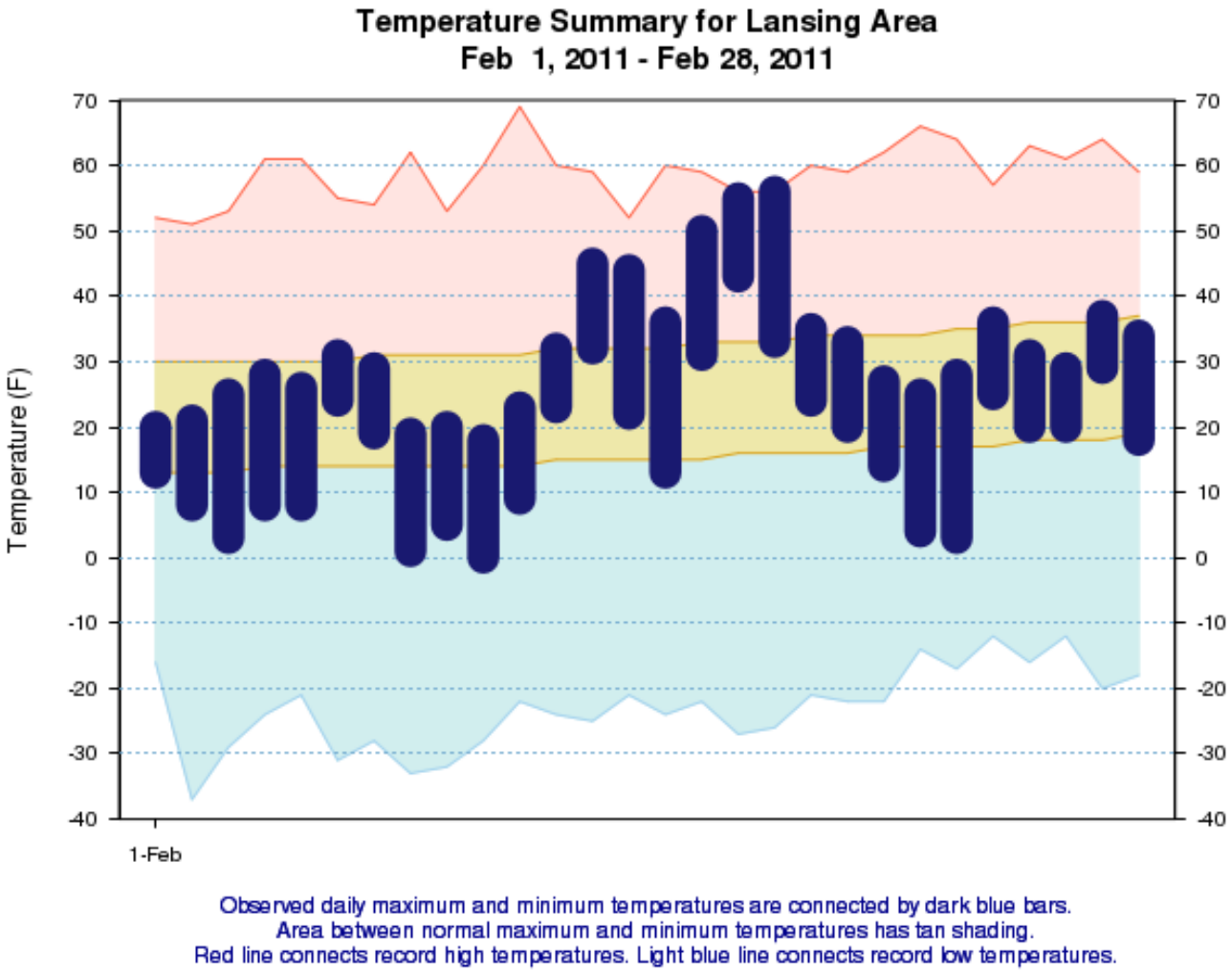

FIG. 4. As in Fig. 3, except for the Lansing/Capital City Airport.

At Lansing, record warmth occurred on the 18th (Fig. 4) with a new daily record high of 56 degrees. With a more significant record database than Grand Rapids, record lows were never threatened as most of the coldest February lows ever recorded were colder than 20 degrees below zero. Lansing never got below zero this month.

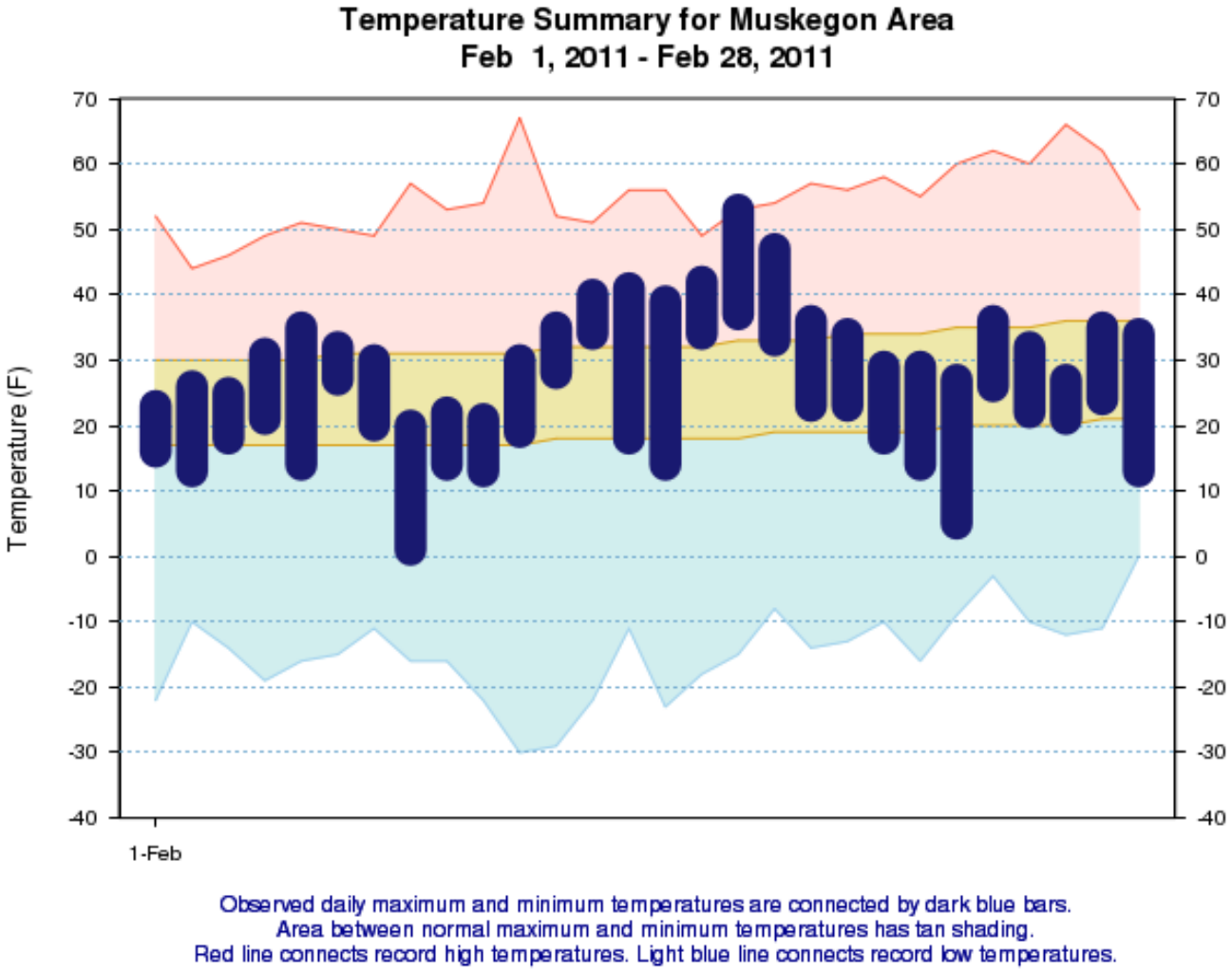

FIG. 5. As in Fig. 3, except for the Muskegon County Airport.

At Muskegon, record warmth occurred on the 17th (Fig. 5) with a new daily record high of 53 degrees. Muskegon only managed to reach or exceed 50 degrees once whereas Grand Rapids did it twice and Lansing did it three times.

Precipitation:

The highest precipitation totals occurred across the southern half of Lower Michigan (Fig. 6). In this region, amounts of 3 inches or greater were recorded. Farther north, precipitation in the 1.5 to 2.0 inch range was common. Consequently, the greatest positive departure from average was across the Interstate 94 corridor and points south (Fig. 7). This region was in a more active storm track. The northern half of the state experienced drier than normal conditions.

February 2011 Summary for Southwest Lower Michigan

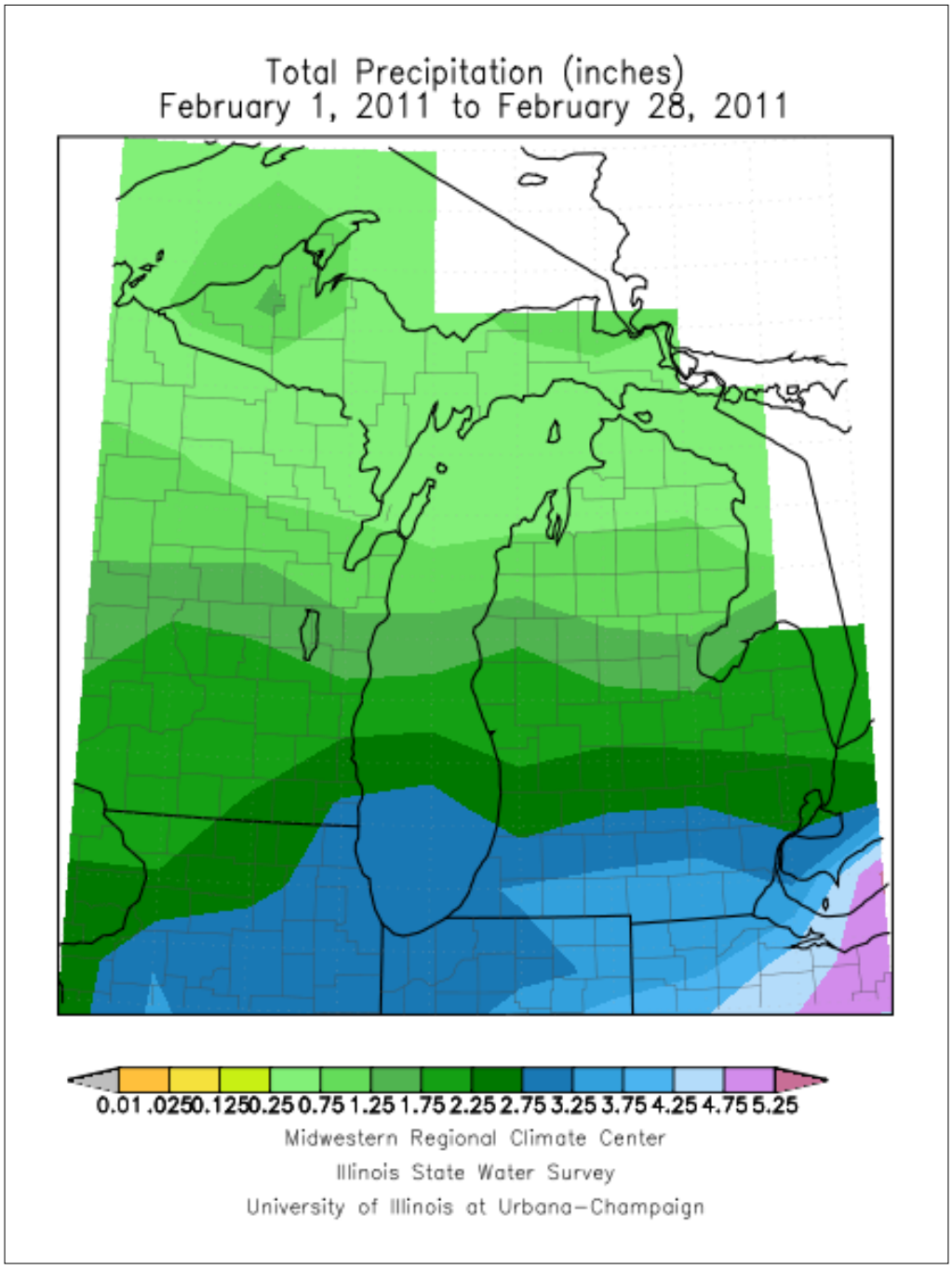

FIG. 6. Total precipitation for Michigan during February 2011.

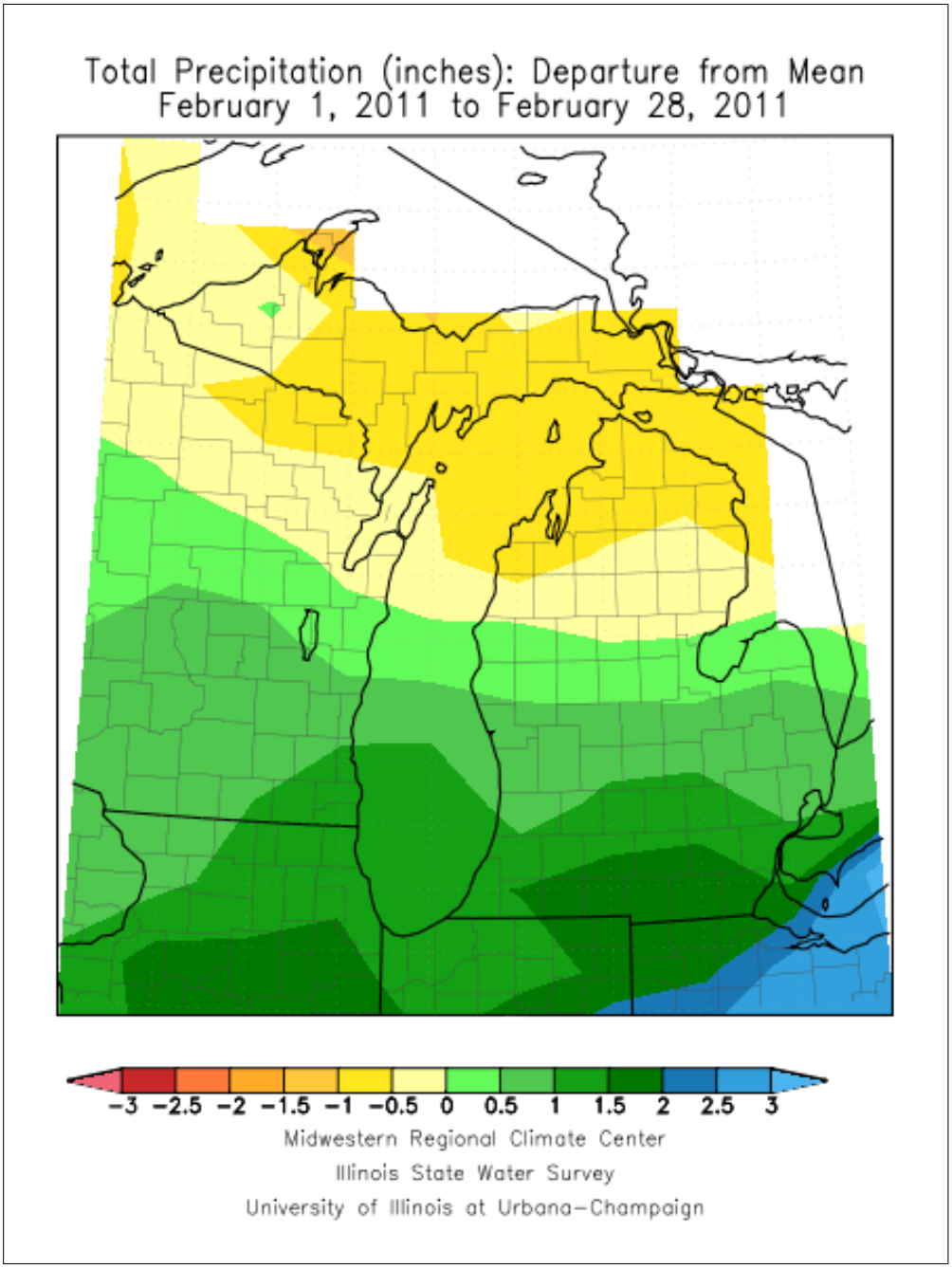

FIG. 7. Precipitation departure from normal for Michigan during February 2011.

February 2011 Summary for Southwest Lower Michigan

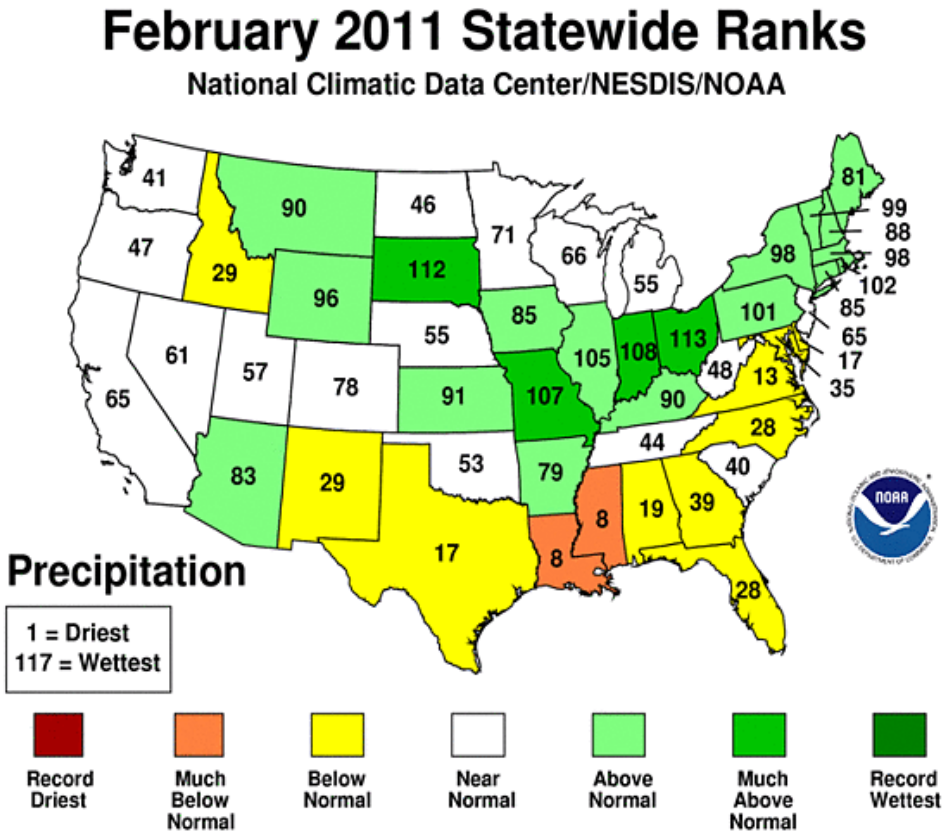

FIG. 8. National Climate Data Center state precipitation ranking for February 2011.

Michigan had its 55th driest February on record (Fig. 8). Just to the south, much above normal precipitation was noted across the Lower Midwest and Ohio Valley region. Although far southern Lower Michigan had above normal precipitation, much of the northern half of the state was below normal. This is a key factor in Michigan ranking 55th driest.

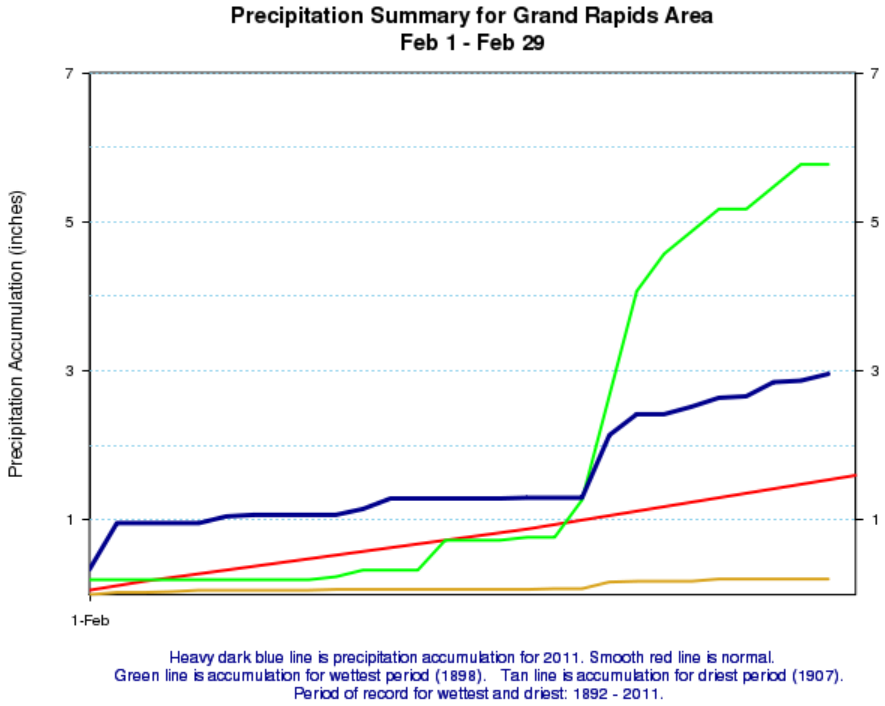

FIG. 9. Precipitation accumulation in inches for February 2011 at the G.R. Ford International Airport.

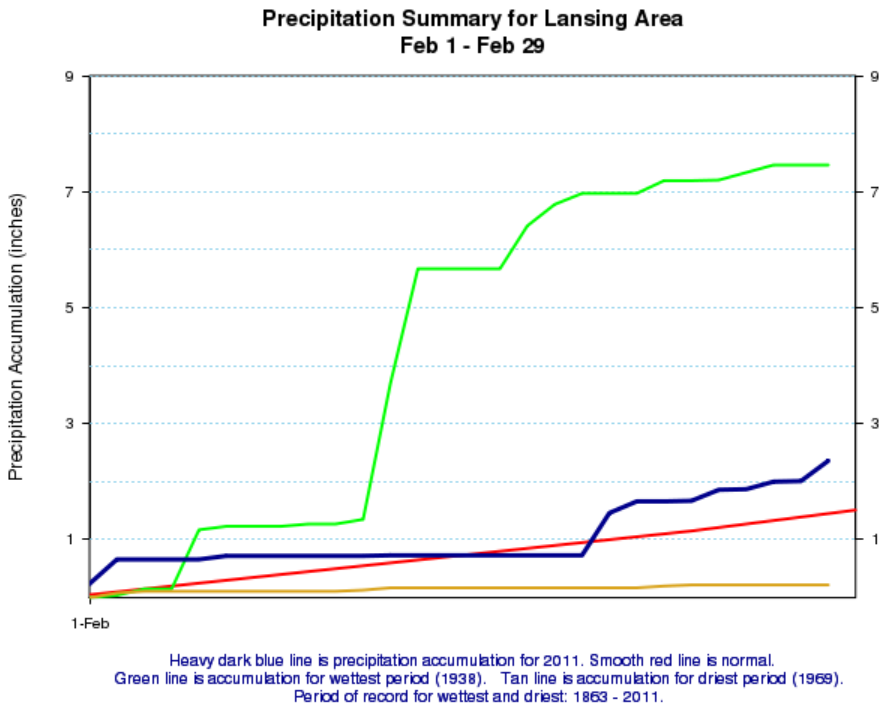

FIG. 10. As in Fig. 10, except for the Lansing Capital City Airport.

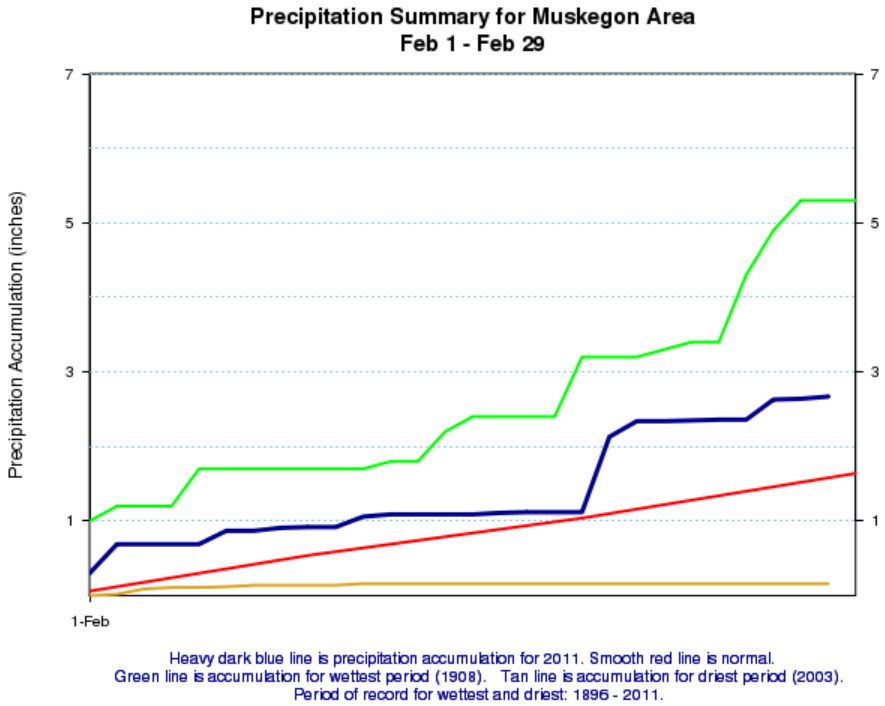

FIG. 11. As in Fig. 10, except for the Muskegon County Airport

It is interesting to note that all three climate sites recorded the highest precipitation total for the month on the 20th (i.e., the spikes in the blue curves in Figs. 9-11). This was a result of snowfall, not rain. These sites received between 6 and 9 inches of snow that day. Melting the snowfall yielded water equivalents between three quarters of an inch and one inch. Even though more snow fell on the 2nd, it was a drier snow, resulting in a smaller amount of liquid equivalent precipitation.

Snowfall:

It was a record setting month for Lansing in terms of snowfall. No other February on record rivaled the amount of snow received this month (29.1"). The blizzard on the 2nd played a vital role in boosting this total. At Grand Rapids, this February ranked 2nd all time for snowfall. The snowiest February was 2008, which benefited from being a leap year. Over 4 inches of snow fell on the 29th that year. Leaving out that extra day in 2008 would move this February to first place. Muskegon's total ranked fourth. Were it not for the blizzard, these totals would be much less.

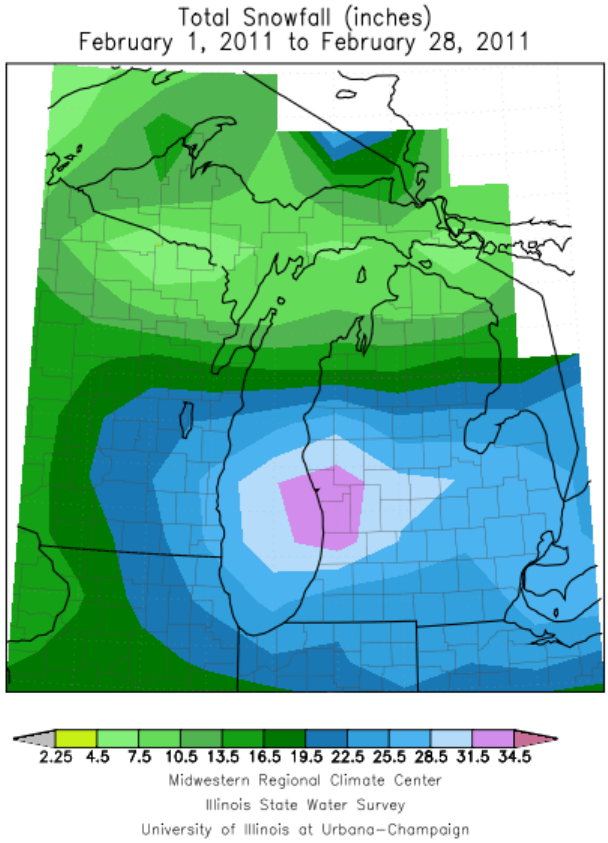

FIG. 12. Snowfall total for Michigan during February 2011.

Higher snowfall near Lake Michigan is quite evident in Fig. 12. Some of this likely was due to lake enhancement of systems crossing the lake. A lot of the snow, particularly in the pink and light blue region of Fig. 12, resulted from the blizzard.

Overall, snowfall totals were very high, with record or near record amounts across Southwest Lower Michigan. The higher snow totals in Fig. 12 correlate closely with the greatest departures from average (Fig. 13).

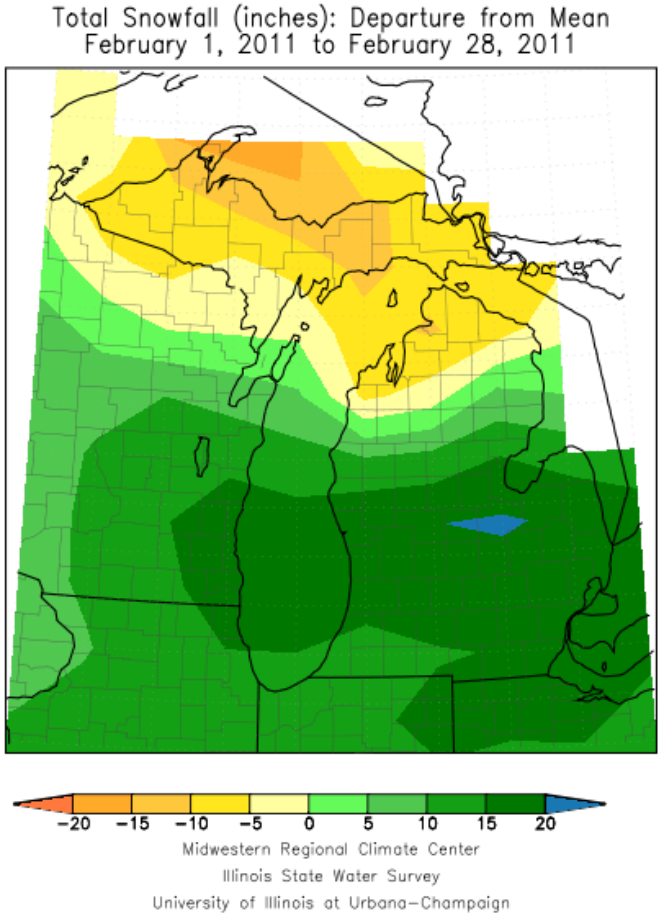

FIG. 13. Snowfall departure from normal for Michigan during February 2011.

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Highlights of the month of February 2011

1st – 2nd

The Blizzard of 2011 struck toward nightfall on the 1st and lasted through mid morning on the 2nd. During the height of the storm, wind gusts over 50 mph were recorded in some areas. This was combined with widespread 10 to 20 inches of snowfall across the region (Fig. 14). This lead to blowing snow and blizzard conditions. Most, if not all, schools were closed across the area. In addition, some businesses and government offices closed for the first time since the Great Blizzard of 1978. Flights were cancelled at Gerald R. Ford International Airport. The storm produced winds up to 70 mph on the Chicago lakefront. Hundreds of cars were stranded on Lakeshore Drive, a scene reminiscent of classic blizzards that struck the region in the 1960s and 1970s.

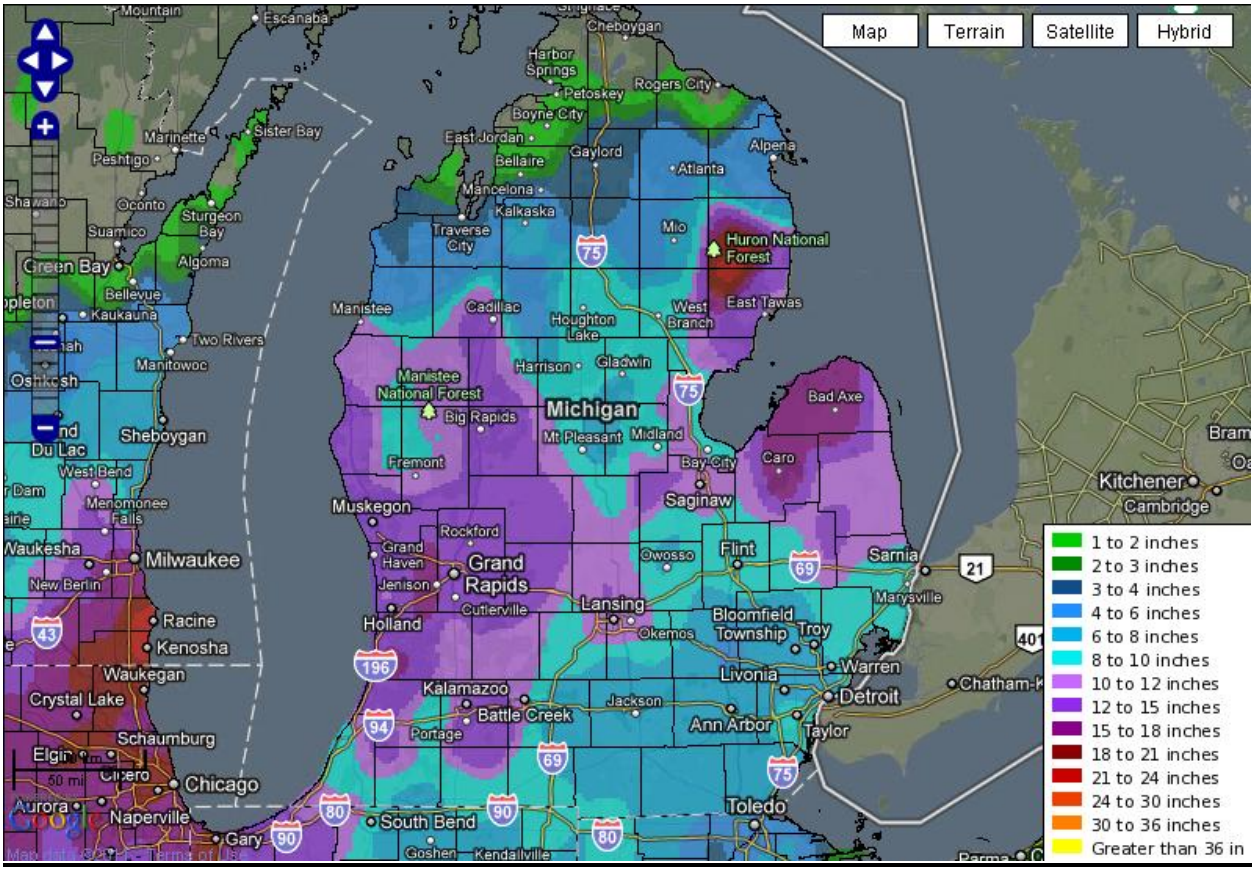

FIG. 14. Storm total snowfall, February 1-2.

16th-18th

After a fairly lengthy period of chilly and benign weather, temperatures warmed considerably across the area during the middle of the month. Lansing recorded three

days in a row with highs at or above 50 degrees, well above normal for the middle of February. Record highs were either set or tied in Grand Rapids and Lansing during this stretch. In addition, gusty winds on the 18th pressed into the 40-50 mph range out ahead of a cold front that moved toward the area. Warm, dry, and windy conditions helped melt most or all of the snow across the area.

20th-21st

After basking in the 50s, colder and more wintery weather returned to the area as a strong winter storm took aim on the region. Areas from Grand Rapids to the north received 6 to 12 inches of snow as well as some sleet (Fig. 15). A 60-car pileup occurred on U.S. 131 near Big Rapids on the 20th, with poor road conditions noted at the time. Further south along the Interstate 94 corridor, the precipitation was almost exclusively freezing rain. This created one of the worst ice storms to ever hit the area. Up to three quarters of an inch of ice accumulated on surfaces (Fig. 16). Trees and power lines came down under the weight of the ice. Thousands of households lost power during the storm. Many schools were forced to close.

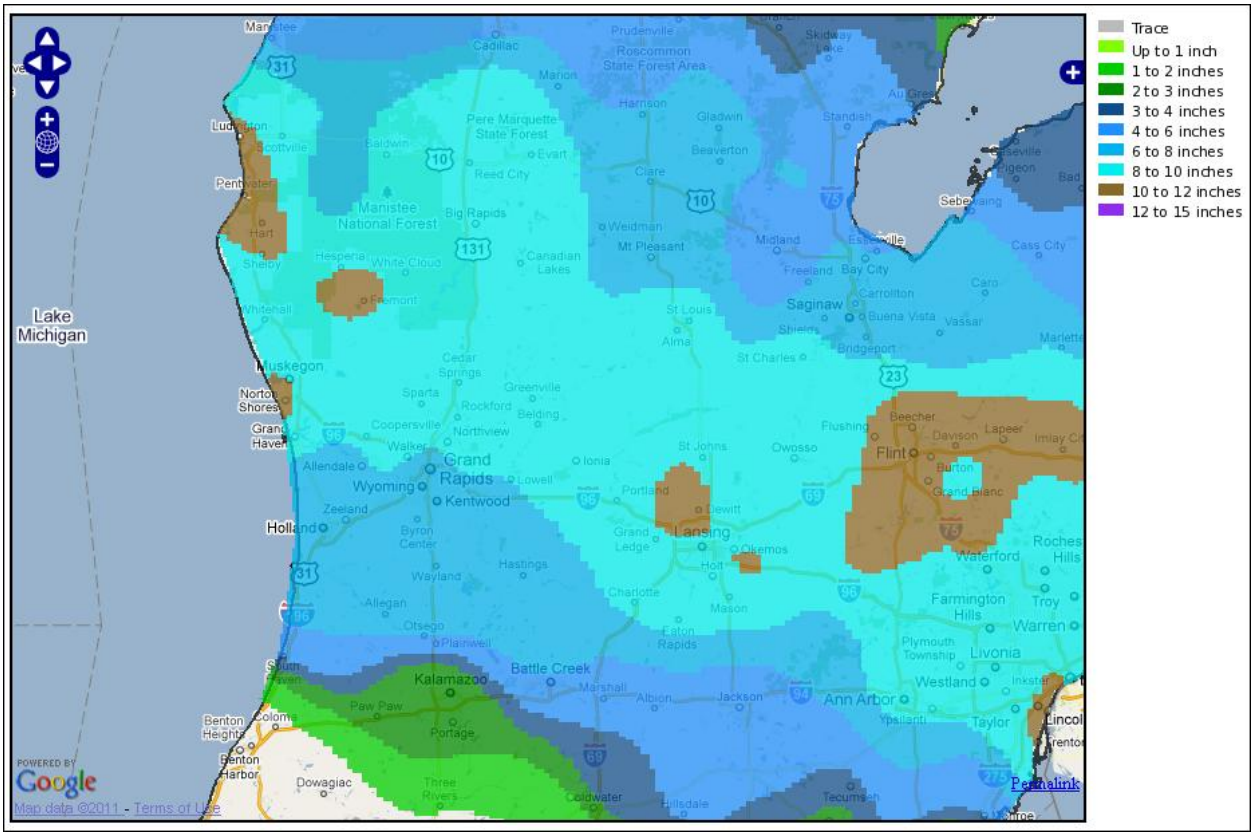

FIG. 15. Storm total snowfall, February 20th – February 21st.

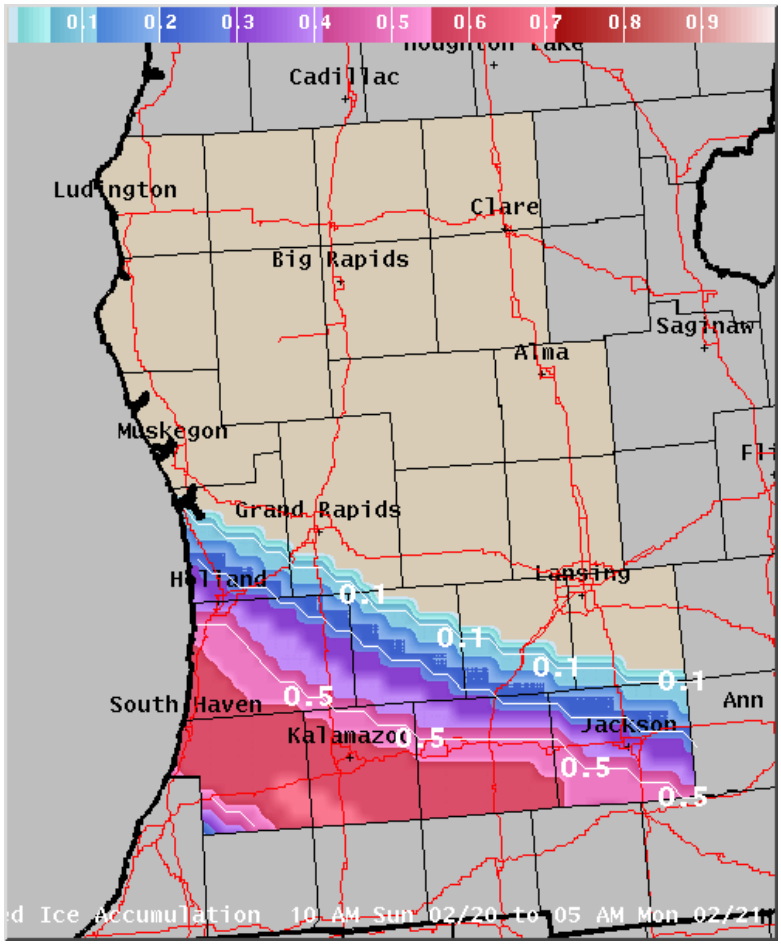

FIG. 16. Storm total ice accumulation, February 20th – February 21st.

23rd-28th

Light to moderate additional snowfall occurred during the last several days of the month, particularly on the 26th. Although there were no major storms, the additional snowfall helped boost totals into record or near record territory for the month.